NOVA SCOTIA DIMENSION STONE

for
DESIGNERS
DEVELOPERS
QUARRIERS

Nova Scotia

Nova Scotia's earned reputation as Canada's East Coast playground derives from its nearly 8,000 km of coastline washed by four bodies of water: the Atlantic Ocean, Bay of Fundy, Northumberland Strait and the Gulf of St. Lawrence.

This 54,000 km^2 peninsula, with no point farther than 60 km from the water, has a population of 875,000, half of which is concentrated in 2 major metropolitan areas — Halifax, the capital, and Sydney.

Nova Scotia's climate is maritime and tempered by the presence of the sea. Average temperature in Halifax is 22°C (72°F) in July and keeps to a typically mild 0°C (32°F) in January.

A unique stone trading location

Dimension stone is a commodity with excellent development opportunity in Nova Scotia, which uniquely combines two of the world's most sought after pre-requisites for successful worldwide marketing of building stone — abundant freestone and granite deposits and strategic location for export trading.

The Province's unique strategic geographical location provides multiple links to major trading routes — whether by sea, land or rail.

Direct access to ocean transportation provides ready access to lucrative markets of the USA's Eastern Seaboard, Western Europe, the Orient and the Caribbean. The St. Lawrence seaway provides access to central Canada and the southwestern States.

Rail transportation covers virtually all of Nova Scotia's stone producing regions and provides direct links to North America's main rail traffic hubs.

The Province's all-weather highways link-up with the Trans-Canada and the U.S. Interstate highway systems. Sea-going ferries capable of carrying large trucks and trailers connect Nova Scotia directly with the northeastern region of the United States.

1 Granite shoreline — Peggys Cove
2 Rock faced sandstone
3 Halifax area granite, Amherst red sandstone — Armouries, Halifax
4 Chamfered, fluted ashlar — Province House, Halifax
5 Chamfered, fluted sandstone

Abundant stone resources and know-how

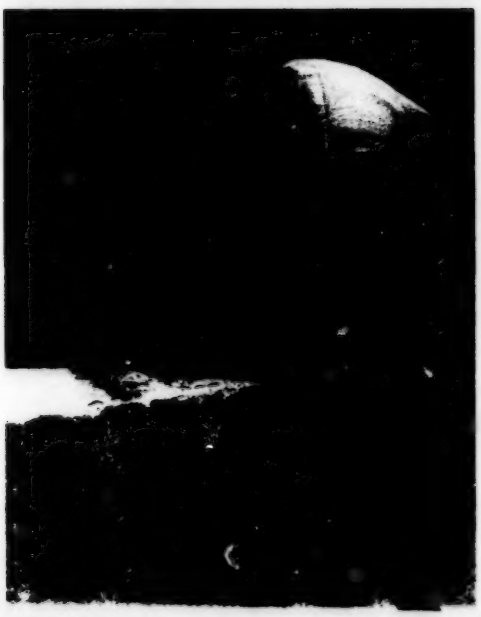
The exploitation and use of Nova Scotia sandstone and granite for foundation courses, monuments and dimension stone applications date back to the mid 1700s.

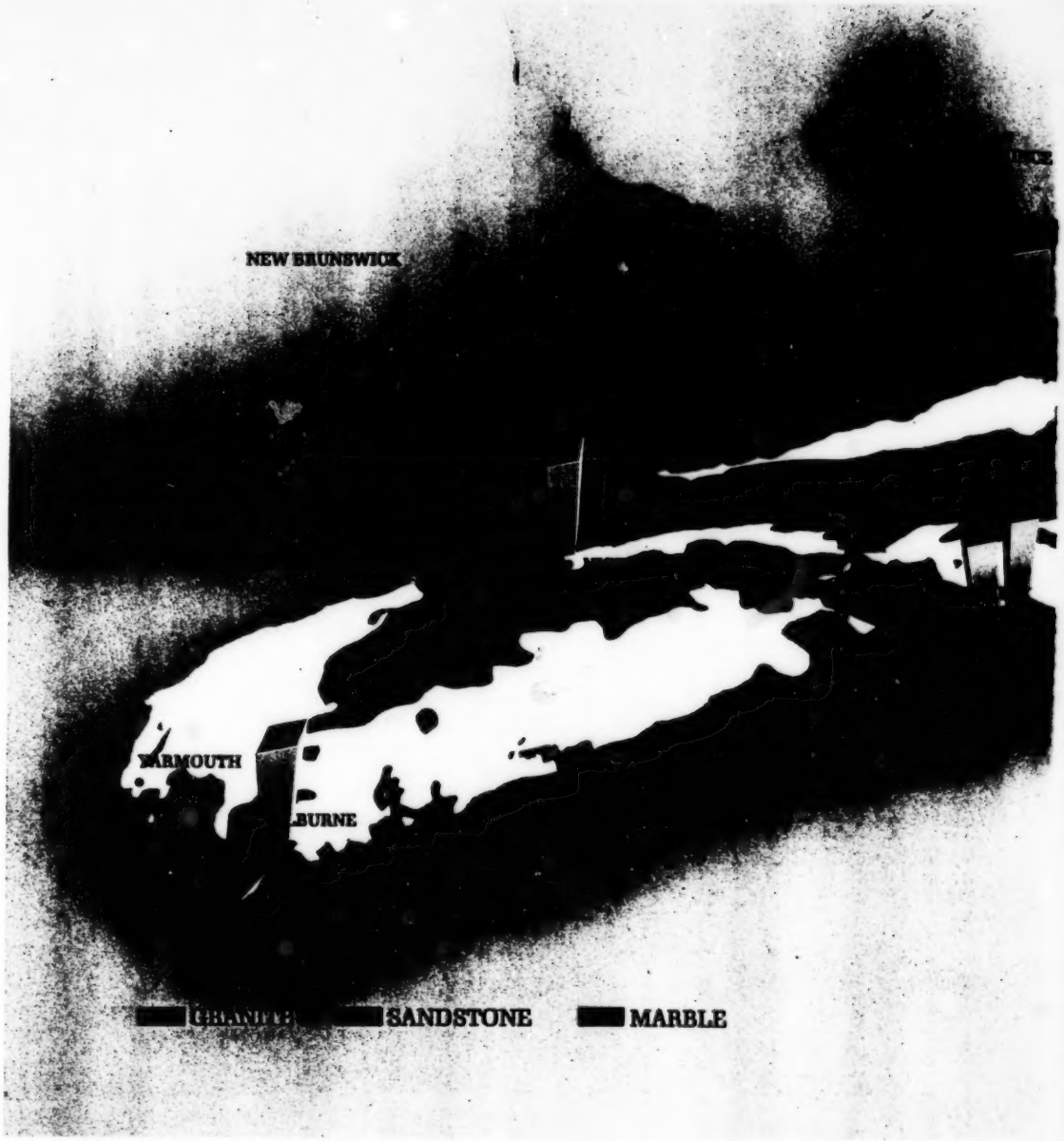
As North America's transport infrastructure evolved, the unique aesthetic and physical properties of Nova Scotia sandstone and granite were sought after by builders and used in several major projects both in Canada and in the USA. Some Nova Scotia sandstone even found its way to California.

By the mid 1800s, Nova Scotia had become a major exporter of stone with as many as 75 quarries actively involved in the extraction and processing of sandstone and granite.

Many of North America's buildings are stone and Nova Scotia sandstone was a popular construction material. A high proportion of these buildings, especially those built in the late eighteenth and early nineteenth centuries, need to be restored and preserved for future generations.

6 Granite quarry — Nictaux, Annapolis County
7 Granite quarry — Nictaux, Annapolis County
8 Plug and feathers set to split granite block
9 Driving plug and feathers
10 Sandstone blocks weighing up to 10 tonnes
11 Driving plug and feathers



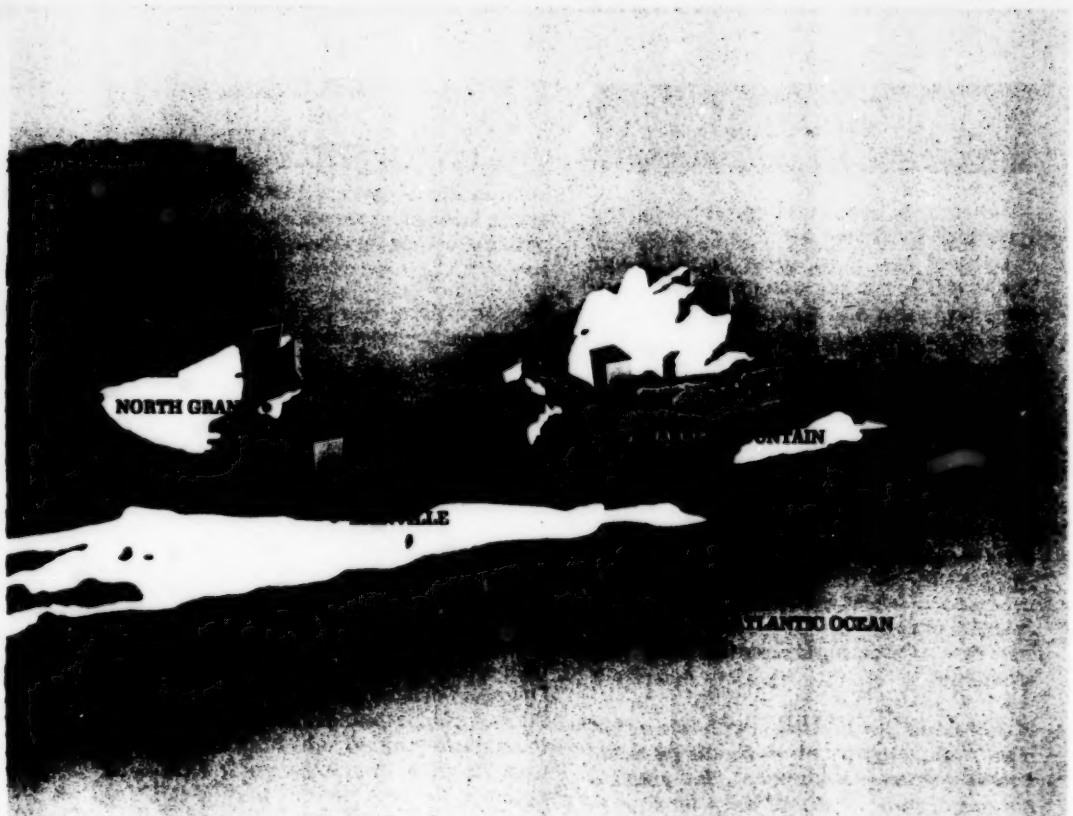


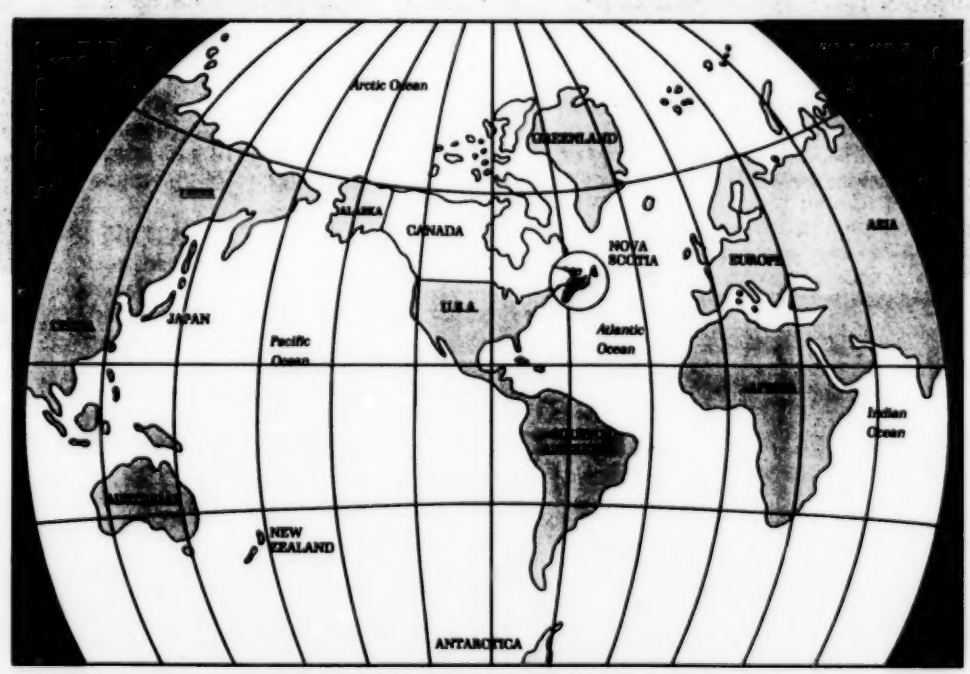
Geology

Nova Scotia is a region which contains great diversity and ages of rock types. Rocks as old as one billion years are found on Cape Breton Island. Many episodes of heat and pressure (metamorphism) have greatly altered these rocks to gneisses, schists, marbles and quartzites.

The granites, slates and quartzites of southern Nova Scotia are about half the age of the marbles of Cape Breton Island. They represent an active period of mountain building, between 350-400 million years ago, which produced a mountain range as high as the present Rocky Mountains. Erosion of highland areas throughout northern Nova Scotia and Cape Breton Island over the next 100 million years resulted in the deposition of thick sandstone and shale beds which host the Province's rich coal fields. Continuing erosion and coastal movements, along with an ice age spanning the last 60,000 years, have given rise to today's landforms. The massive ice sheet reached over 1 km in thickness and stripped many areas of Nova Scotia bare to bedrock while depositing thick mantles of rocks, soil and debris over others.

From these diverse geological endowments, Nova Scotia has in the past and continues to produce building stone ranging from the Precambrian marbles of Cape Breton through the Devonian granites of the southern mainland, to the Carboniferous sandstones of the northern mainland.


NORTH GRA
NTAIN
LE
TLANTIC OCEAN


Arctic Ocean
GREENLAND
CANADA
NOVA SCOTIA
ASIA
JAPAN
U.S.A.
Pacific Ocean
Atlantic Ocean
Indian Ocean
NEW ZEALAND
ANTARCTICA

SANDSTONE

Sandstone is composed mainly of quartz grains of sand size set in a fine grained matrix of silt, clay, silica or carbonate cement. Other minor constituents include feldspar, mica and minor iron minerals. Sandstone occurs in a wide range of colour, grain size and texture.

The sandstones of northern Nova Scotia, which have been quarried for dimension stone, may be divided into two broad categories – red sandstone from Amherst, Northport and River John and olive, buff and grey sandstones from Wallace, Eight Mile Brook, Sawmill Brook and the McKeen quarry.

Recent studies have outlined significant reserves of sandstone at the following locations.

1. WALLACE QUARRY

The Wallace quarry has produced three colours of stone in the past. The greatest volume of stone produced was a medium to dark olive-green, fine- to medium-grained massive sandstone of Late Carboniferous age. The average thickness of the quarried unit was 12 m. It overlies a fine- to medium-grained blue-grey sandstone with an average thickness of about 3 m. A light olive-green sandstone was also produced from small pockets on the northwestern sides of the quarry. A recent diamond-drilling program has outlined an additionnal 10,000 m^3 of olive-green sandstone and 33,000 m^3 of blue-grey sandstone.

2. AMHERST QUARRY

This is one of the oldest quarries in northern Nova Scotia and the pinkish-red stone raised for building stone from this location is probably as well known as the olive-green Wallace stone. The quarry is about 30 m deep, 100 m in diameter and presently inactive.

Recent drilling has outlined 27,000 m^3 of red sandstone and the resource is open in all directions.

3. EIGHT MILE BROOK

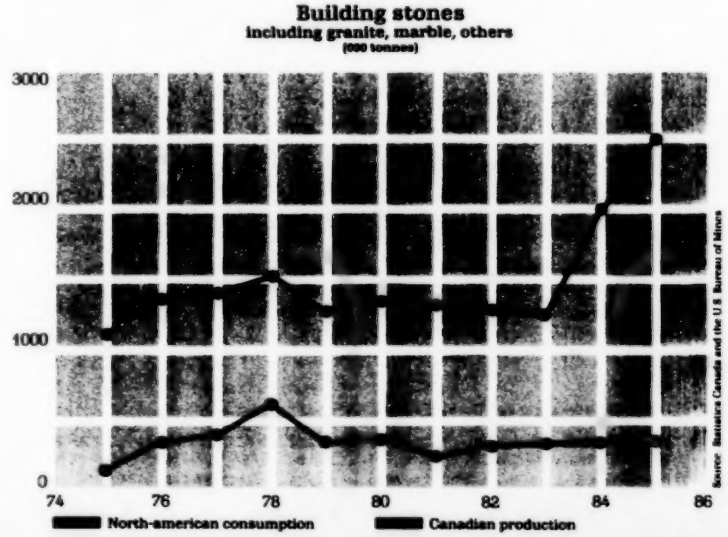
A small quarry producing light grey sandstone was operated by a gravestone manufacturer on Eight Mile Brook at the beginning of this century. A drill program in 1986 outlined 26,000 m^3 of high quality grey sandstone.

4. HARDWOOD HILL

A new sandstone quarry was recently opened near Hardwood Hill, Pictou County. Diamond-drilling has outlined the presence of a large quantity of tan to olive, fine- to medium-grained sandstone at this location. At present the sandstone is being quarried for rock fill only and no building stone extraction has taken place.

5. ENGLISH PROPERTY (McKEEN QUARRY)

This quarry is one of the oldest building stone quarries in Nova Scotia, having produced stone for many local buildings and the export market. The sandstone is grey, tan and olive in colour and is generally medium- to coarse-grained. Diamond-drilling is required north of the present face to extend the reserves of the quarry.



GRANITE

Granites are the most universally used monumental and building stones and are widely used as cladding panels, pavers, thresholds, steps and risers, and for monument blanks and press rollers.

A large portion of Nova Scotia is underlain by granitic rocks. Past granite production has exploited the South Mountain Batholith and its related satellite plutons in areas such as Shelburne, Nictaux, Halifax and Terence Bay.

The eastern shore region of the Province boasts a number of plutons of "black granite". The old black granite quarry at West Erinville produced thin slabs of a good quality black granite (gabbro) for the monument industry.

Recent studies have outlined significant reserves of granite at the following locations.

1. TERENCE BAY

Two types of granite are available in the Terence Bay area. A white monzogranite containing less than 10% mafic minerals is present on the shoreline directly across the Terence Bay River from the village of Terence Bay. Farther inland the monzogranite is more grey in colour and typically has more mafic minerals.

Recent drilling has outlined 220,000 m^3 of granite to a depth of 14 m. There is no overburden cover and the resource is considered to be open in all directions.

2. NICTAUX

Near the village of West Nictaux, which is located a short distance from the town of Middleton, Annapolis County, a medium- to fine-grained, blue-grey granite is presently being quarried. Heritage Memorials Ltd. quarries about 1,500 tonnes of blue granite per year for use as monument bases, blanks and other specialty products.

3. QUARRY LAKE (HALIFAX AREA)

Past granite production from the Halifax area occurred along the margin of the granite pluton which covers a very large area west of the city. The rock is a grey, medium- to coarse-grained porphyritic granodiorite which contains abundant xenoliths or "knots" of slate. Large quantities of the stone have been used in building construction, and for curbstone and paving blocks. Although the Quarry Lake area has not been drilled, it appears to contain a large reserve of granite suitable for building stone.

4. SHELBURNE

Past production of granite for monuments and building construction took place near the Shelburne Harbour area. The rock is a fine- to medium-grained, grey muscovite-biotite granodiorite to monzogranite. Although there is no production from the area at the present time, the stone has proven very suitable for architectural work in the past.

5. ERINVILLE

Past production of "black granite" (gabbro) for monuments took place at Erinville, Guysborough County, in the early 1930s and again in the early 1960s. The gabbro consists of a fine- to medium-grained dark grey to black rock composed of labradorite, pyroxene and amphibole with minor amounts of ilmenite and apatite. Recent drilling has outlined a small gabbroic plug about 300 m in diameter which may be suitable for the production of quarry blocks.

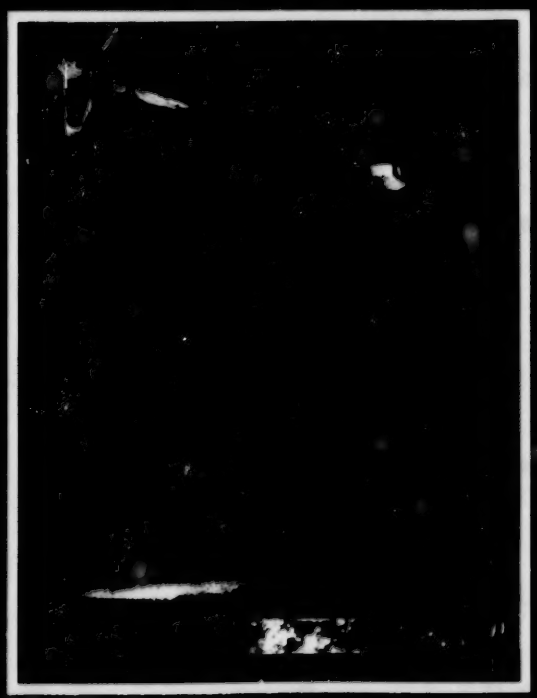
MARBLE

Significant quantities of marble are imported into North America for use as decorative panels, floor tiles and trim for both interior and exterior applications.

The use of marble and other decorative rocks is also increasing in the manufacture of exposed aggregate panels. Stone chips are also being used in the landscaping field, as is stone for walls and walks. Minor amounts of marble and alabaster are used by sculptors and in other specialties of the arts.

Large deposits of white, grey and banded marble occur on Cape Breton Island at Glencoe, Marble Mountain and George River. The marbles tend to be narrow in width and structurally deformed, although sections of white marble up to several hundred metres wide have been intersected by drilling at the Glencoe deposit.

The Marble Mountain deposit is presently being exploited for the production of white marble chips primarily sold in bags at garden centres. This material may also be well-suited for the production of chips for exposed aggregate panels.

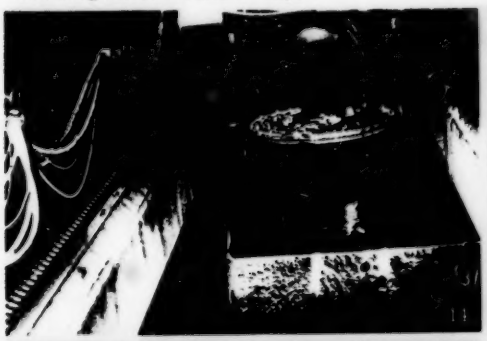


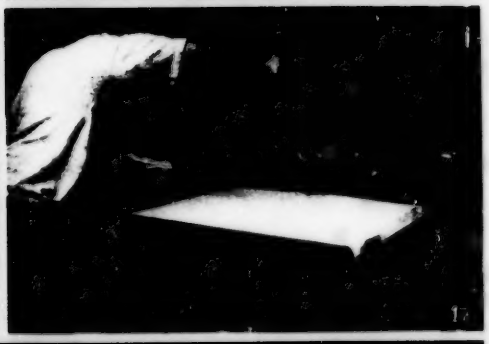
Stone fabrication industry

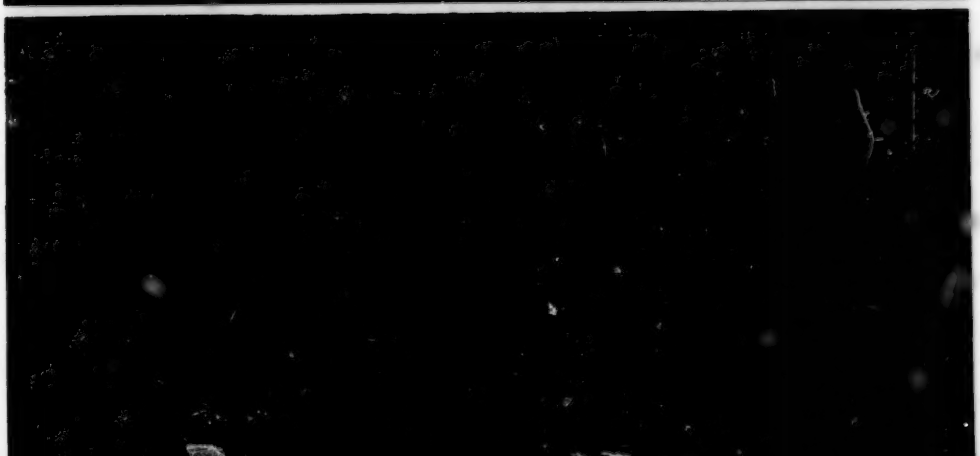
Nova Scotia has many stone processing facilities producing a product line ranging from monuments, mausoleums, desk tops and counter tops in granite to rock-faced ashlar, intricate mouldings and fancy carving in sandstone. Modern plants equipped with state of the art sawing, shaping and finishing machines turn out work of the highest quality.

Both local granite and sandstone are used in addition to many varieties of imported granite and marble. One of our monument manufacturers has pioneered the use of a computerized lettering machine and has the only computer controlled letter-cutting machine operating on a production line in Canada.

12 Diamond saws
13 Diamond saws
14 Polishing granite monument blank
15 Sawing sandstone slab to shape
16 Diamond saw
17 Computer controlled monument lettering
18 Diamond mono-saw in sandstone



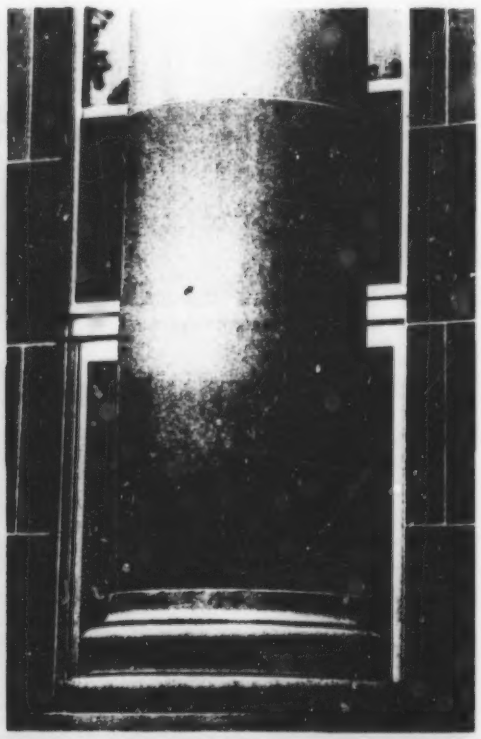




Physical properties

19 Vermiculated panel and quoin – Dominion Building restoration, Halifax
20 Wallace sandstone column – Mount Allison University, Sackville, N.B.

21 North Grant sandstone

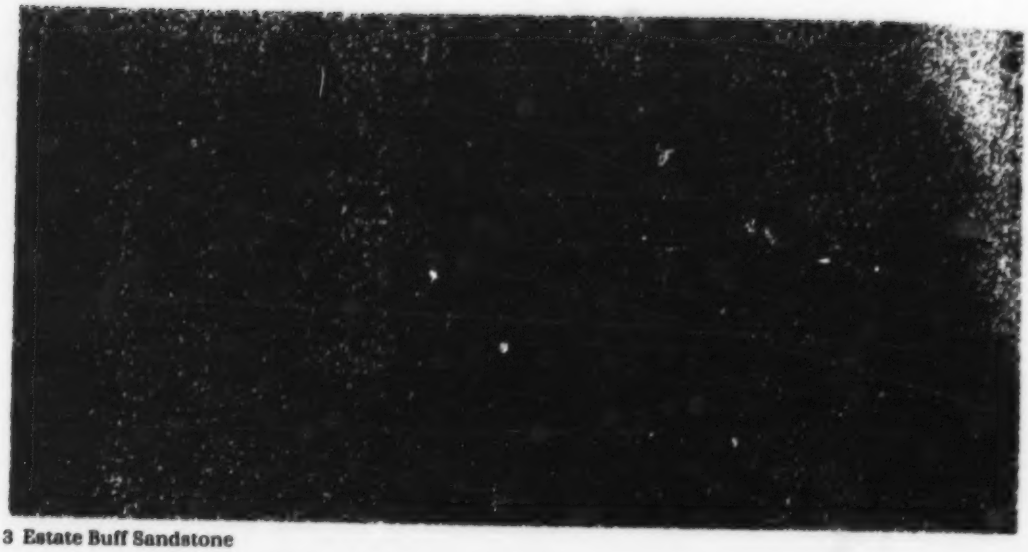


Sample no.	Quarry deposit location	Type of stone	Colour designation	Specific weight lbs/ft^3	Absorption (%)	Compressive strength lbs/in^2	Transverse strength lbs/in^2
1	Amherst	Sandstone	Amherst red	142.93	6.894	11,122	551
2	Hardwood Hill	Sandstone	Scotsburn Buff	–	n.a.	–	n.a.
3	North Grant	Sandstone	Estate Buff	n.a.	n.a.	n.a.	n.a.
4	Wallace	Sandstone	Wallace Olive-Grey	144.81	5.90	13,681	1838
5	Wallace	Sandstone	Wallace Blue	145.87	5.58	15,633	1534
6	Erinville	Granite	Dawn Black	n.a.	n.a.	n.a.	n.a.
7	Halifax	Granite	Silver Grey	167.76	0.208	25,959	2439
8	Nictaux	Granite	Atlantic Mist Grey	167.63	0.137	34,058	3572
9	Shelburne	Granite	Scotia Grey	167.02	0.172	28,440	n.a.
10	Terence Bay	Granite	Brookfield White	164.95	0.209	25,893	2269
11	Marble Mountain	Marble	Alabaster White	n.a.	n.a.	n.a.	n.a.

PRODUCTION STATUS: PRODUCING: 1-5-8-11 PRODUCTION PENDING: 10 DEVELOPMENT OPPORTUNITY: 2-7-9 DORMANT: 1-3-6 n.a.: Data not available at time of printing

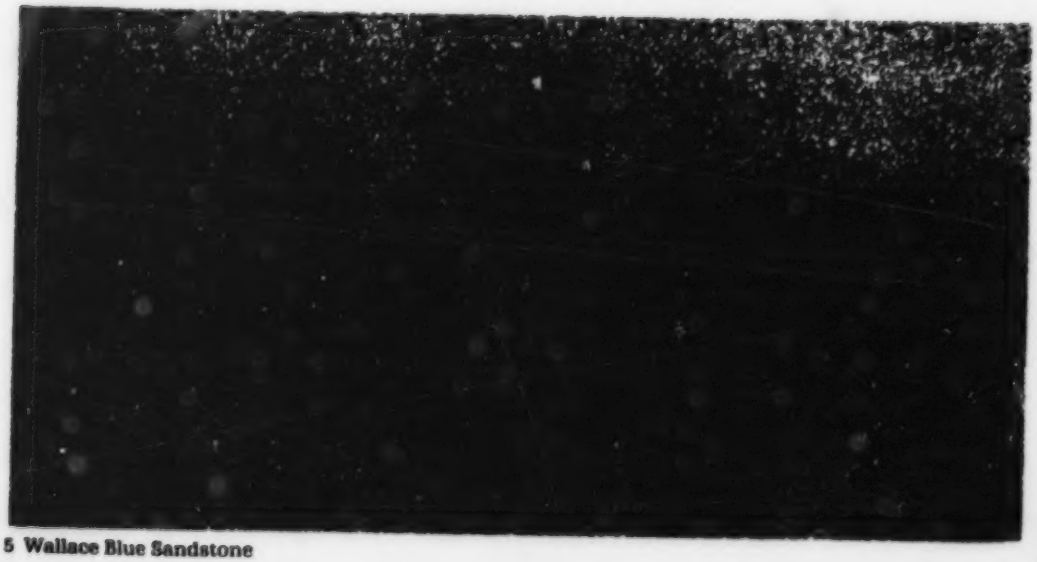
1 Amherst Red Sandstone

2 Scotsburn Buff Sandstone



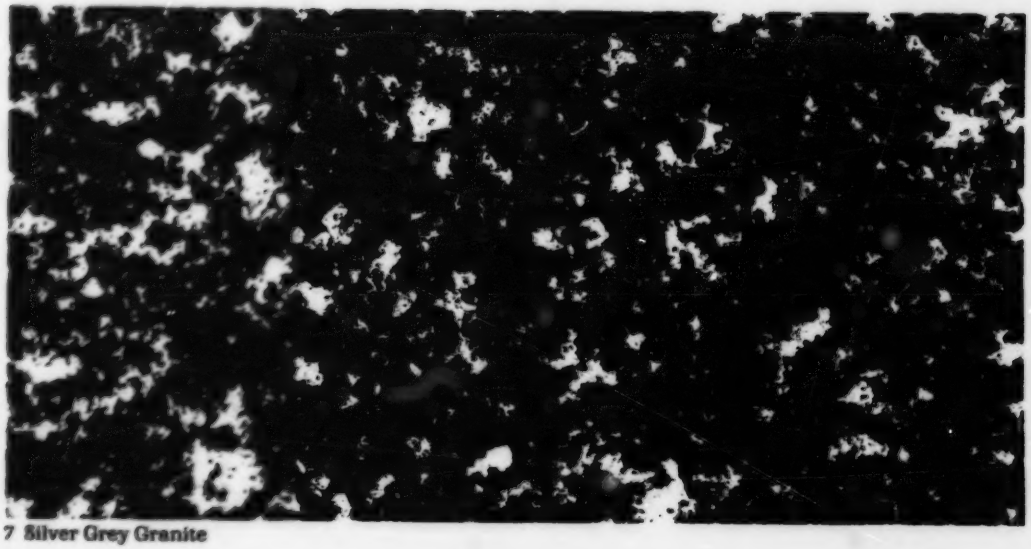
3 Estate Buff Sandstone

4 Wallace Olive-Grey Sandstone

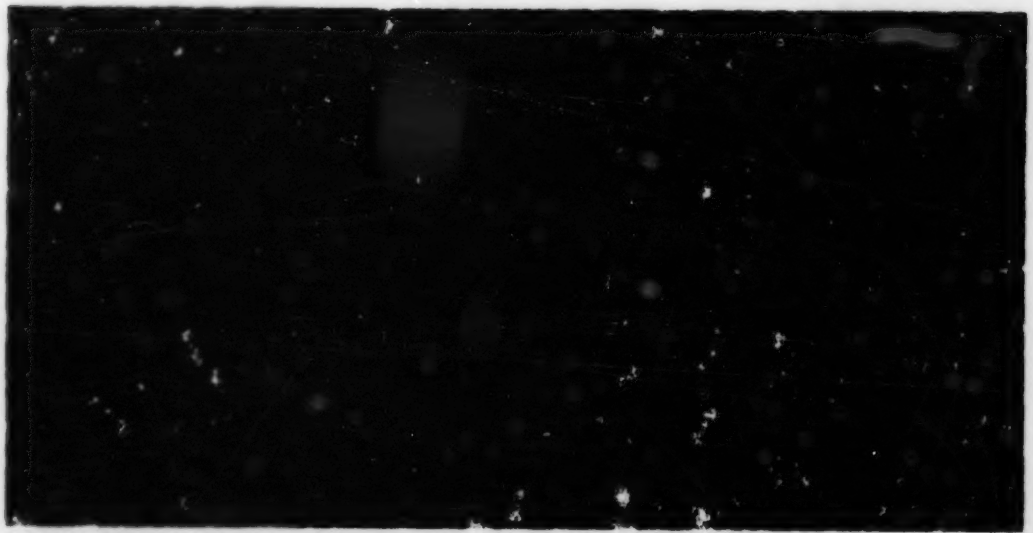


5 Wallace Blue Sandstone

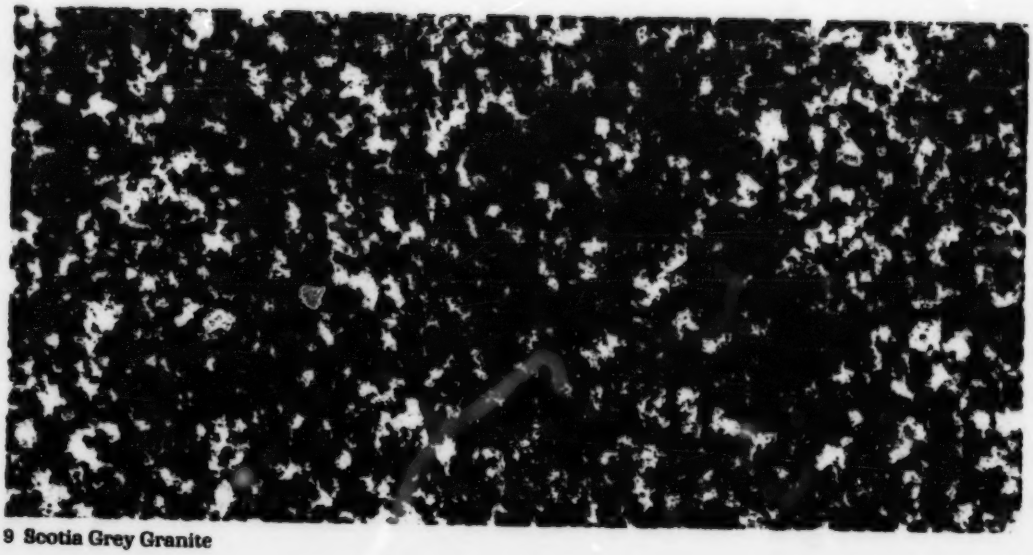
6 Dawn Black Granite



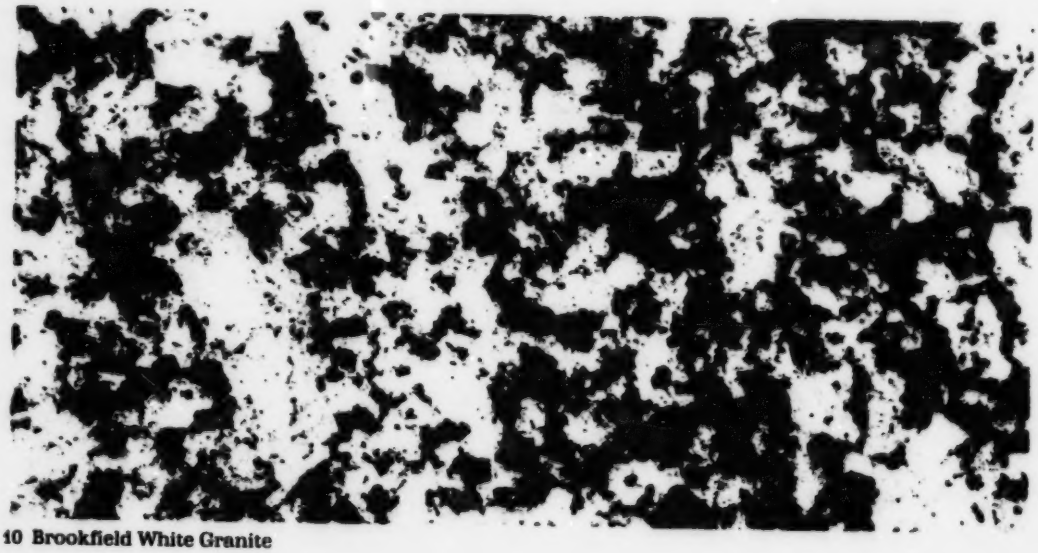
7 Silver Grey Granite



8 Atlantic Mist Grey Granite



9 Scotia Grey Granite



10 Brookfield White Granite

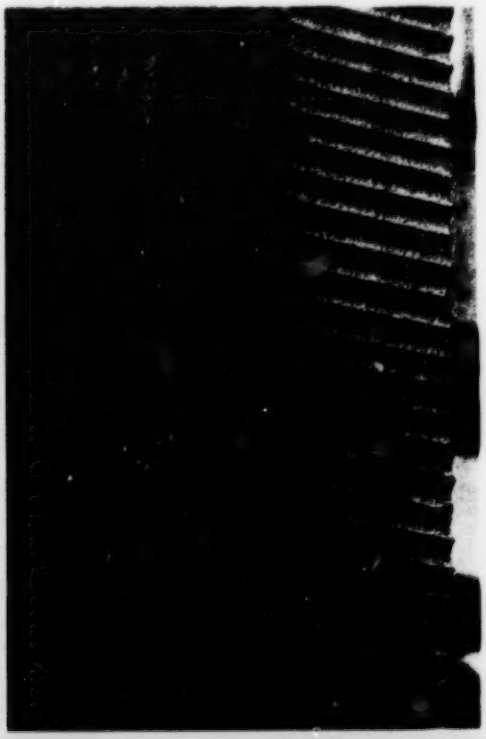
11 Alabaster White Marble

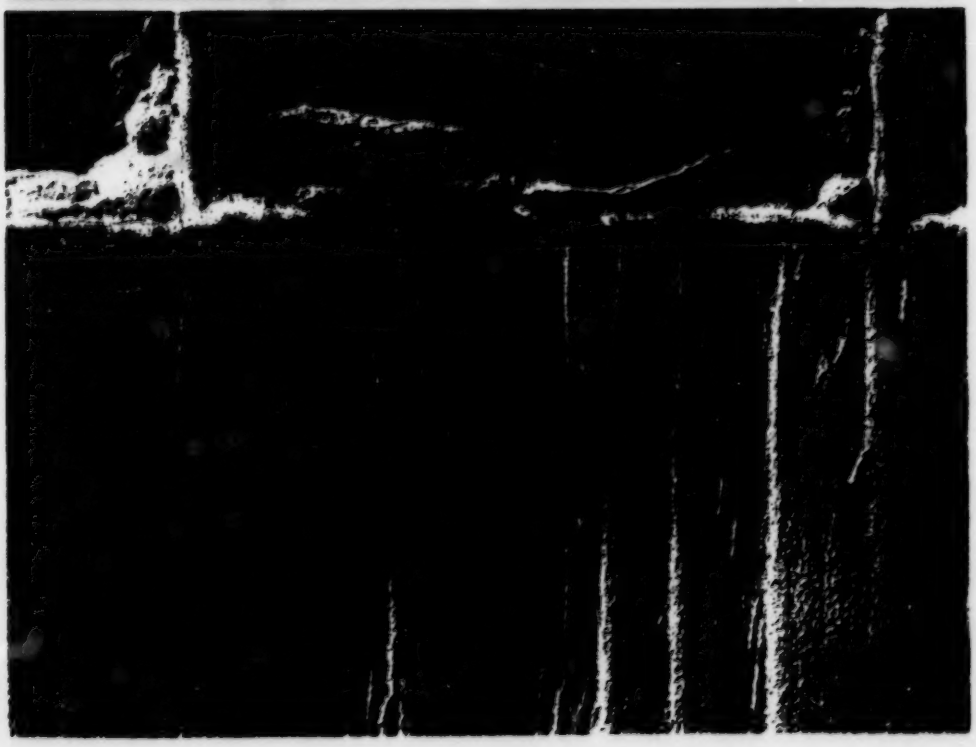
Note: *Due to technological limitations of printing process, colour reproduction of swatches may differ slightly from actual product colour and texture. Please refer to sample catalogue vol. I-II-III-IIII for true colour and texture.*

Sandstone and granite are employed for a great many purposes and must be tested to determine their suitability for specific applications. Granite and sandstone are commonly tested for specific weight, absorption, compressive strength, transverse strength and resistance to abrasion. These characteristics determine the durability of a material or its capacity to resist weathering agents such as acid rain and pollution, freeze thaw cycles, human and vehicular traffic, chemicals and vandalism.

22 North Grant sandstone
23 Wallace sandstone

24 Wallace sandstone and Sackville red sandstone





The art of conservation

Five types of interventions are possible for the conservation of historic buildings.

PRESERVATION

This type of conservation is applied to historic ruins, where repairs should only be carried out to prevent further decay, maintaining the building in its existing state.

CONSOLIDATION

This operation consists of an application of a chemical element, or adhesive, to enhance the short term stability of the building fac[illegible]g until resources are made available for restoration.

RECONSTRUCTION

Historic buildings that are unstable or endangered are sometimes moved and rebuilt on stable foundations.

REPRODUCTION

This intervention involves the copying of cultural details in areas where the original is beyond repair. Reproductions of the carvings on a building can sometimes be justified if the original has been obliterated by wear, and if sufficient data are available for that carving to be reproduced to its original detail.

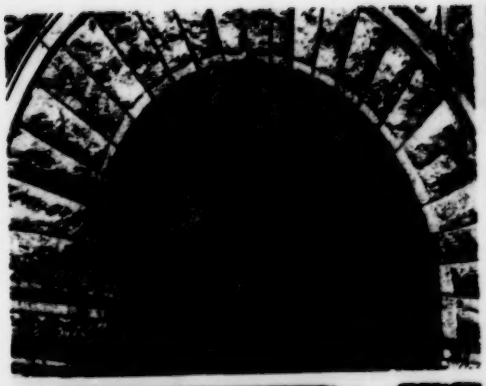
RESTORATION

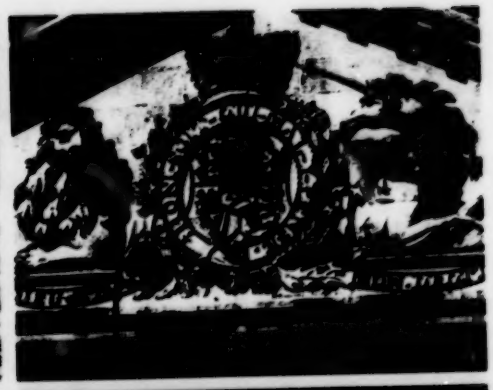
The art of restoration is intended to return the building to its original concept, restoring only what is necessary to achieve stability and aesthetic value, and to enhance the usage of the building.

Renovation projects involving the renewal of details and features occur frequently and their re-instatement relies on respect for the original design and materials used, plus the use of the original drawings if they are available.

25 Fine carving in sandstone
26 Cutting out weathered sandstone from the quoins — Dominion Building restoration, Halifax

27 Replacing sandstone voussoirs — Dominion Building, Halifax





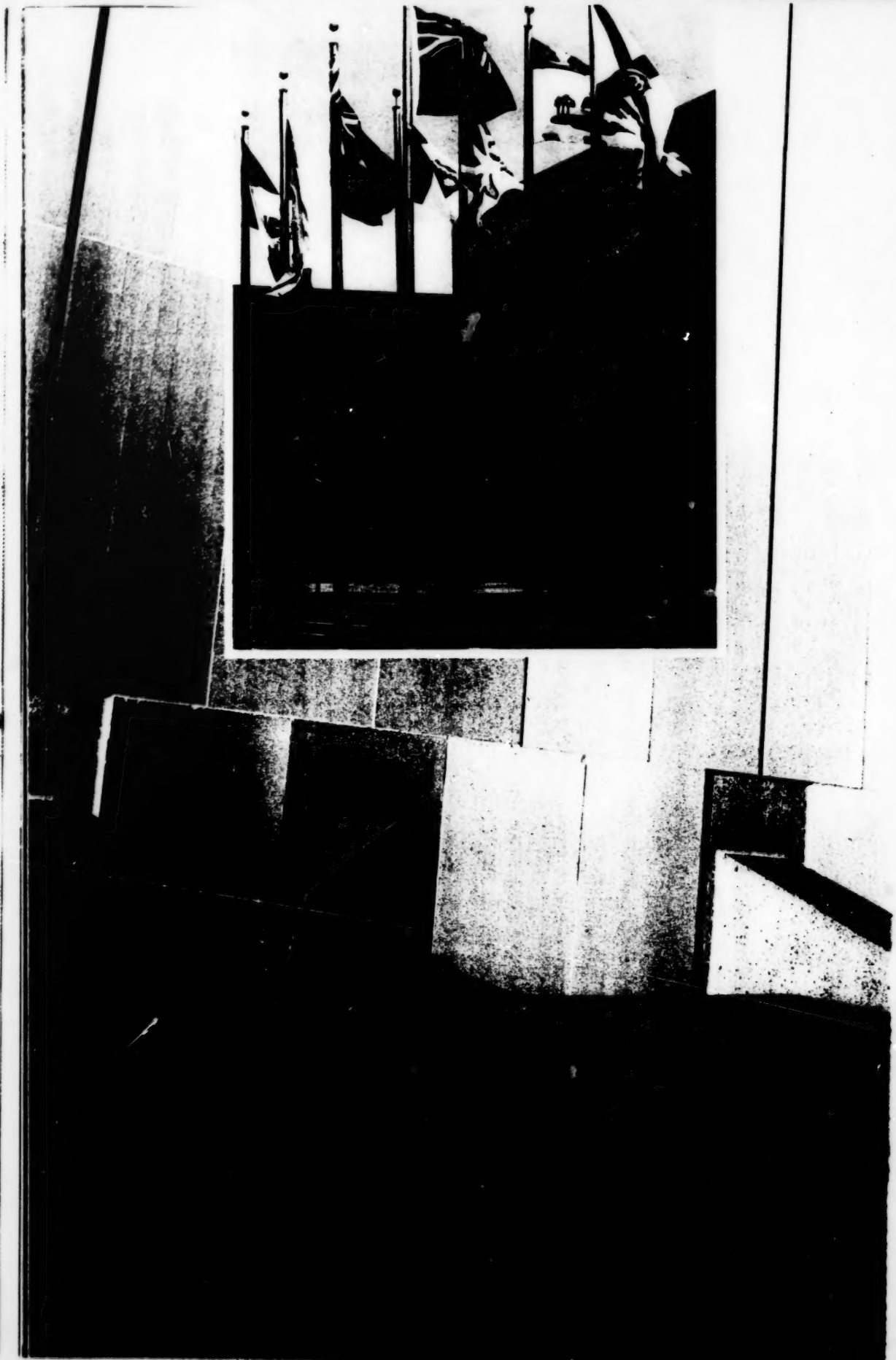
28 Italianate floral enrichments — Dominion Building restoration, Halifax
29 Pictou County and Wallace sandstone — City Hall, Halifax
30 Carving in Wallace sandstone
31 Carving in Marble Mountain marble — Halifax
32 Mary's Point, N.B. sandstone — Sebastopol Monument, Halifax
33 Wallace sandstone (in part) — Peace Tower and Centre Block, Ottawa
34 Britannia in sandstone — Dominion Building, Halifax
35 Tallest granite spire in the world — St. Mary's Basilica, Halifax
36 Fixing a springer — Dominion Building, Halifax
37 Marble carving and arch — Lindola, Halifax
38 Carving in Marble Mountain marble — Halifax
39 Coat of Arms in Pictou sandstone — Province House, Halifax
40 Mausoleum in pink granite — Heritage Memorials, Windsor
41 Carving Italianate enrichments — Dominion Building, Halifax

Stone mason apprenticeship program

In conjunction with the restoration of Province House, Canada's oldest provincial legislature building, the Provincial Government of Nova Scotia established the Stone Mason Apprenticeship Training Program. The program was based on the City and Guilds of London Institute amended to suit Canadian requirements. Instruction was provided by the British restoration company contracted to restore Province House.

This training program is producing some of the best skilled young people in the trade in Canada and in this respect architects, restoration contractors and builders may now rely on a fully-skilled workforce which has the capability to carry out restoration projects and new building construction.

These skilled masons have been taught to recognize the importance of restoring the aesthetic value of a building while enhancing its usage and market value. They faithfully recreate original designs in order to correctly retain architectural significance and historical value.

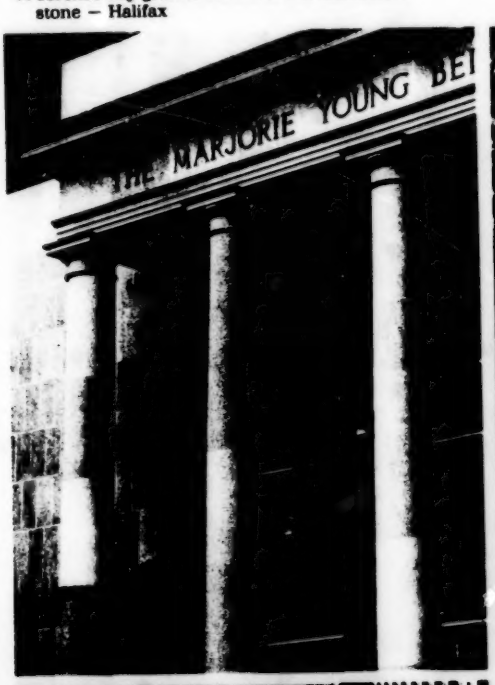


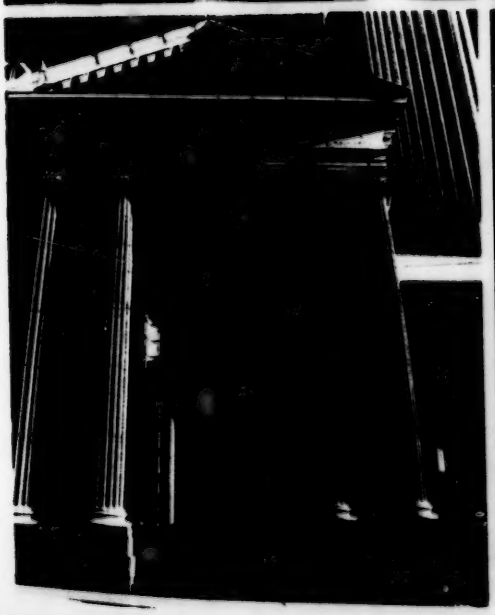
Traditional building stone — A major construction material in modern architecture

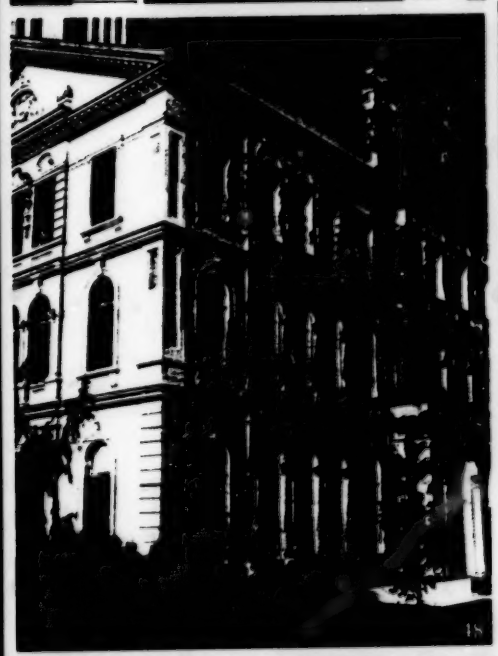
Traditional building construction using dimension stone for load-bearing walls gave way to concrete as the major construction material in the 1940s and 1950s. Most recently, the architectural trend back to using natural stone as facing on concrete buildings has sparked renewed interest in stone production.

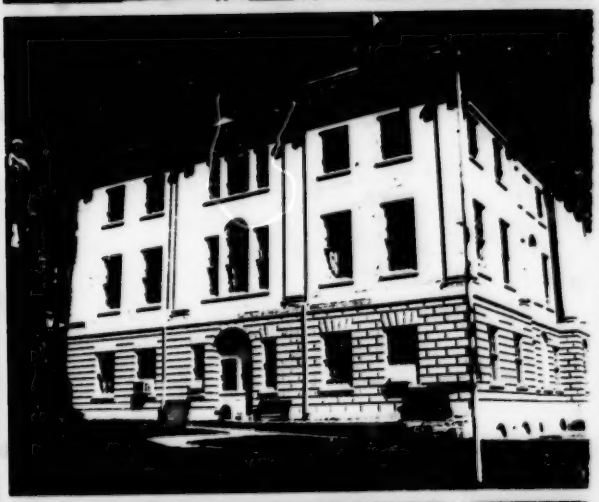
This increasing demand for stone has resulted in the re-activation of dormant Nova Scotia quarry operations.

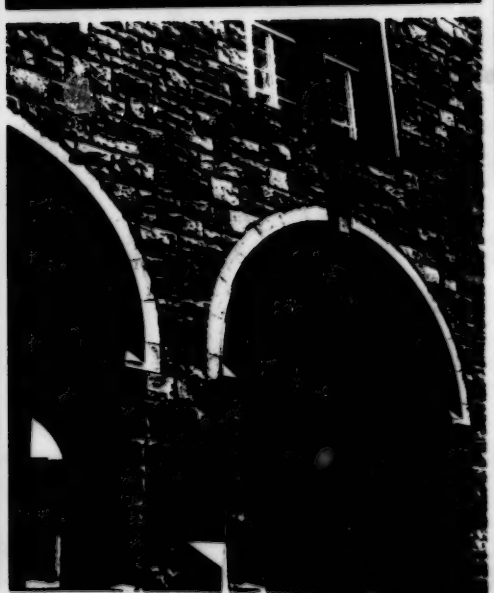
42 Wallace sandstone cladding — Confederation Centre of the Arts, Charlottetown, P.E.I.
43 Wallace sandstone columns and cladding — Mount Allison University, Sackville, N.B.
44 Terence Bay granite columns and dimension stone — Halifax
45 Confederation Centre of the Arts — Charlottetown, P.E.I.
46 Confederation Centre of the Arts — Charlottetown, P.E.I.

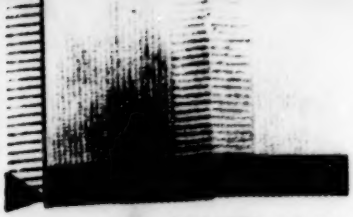


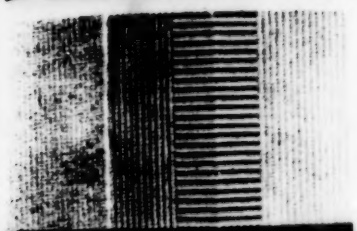


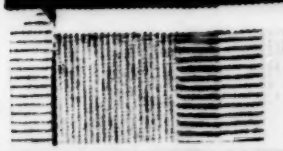












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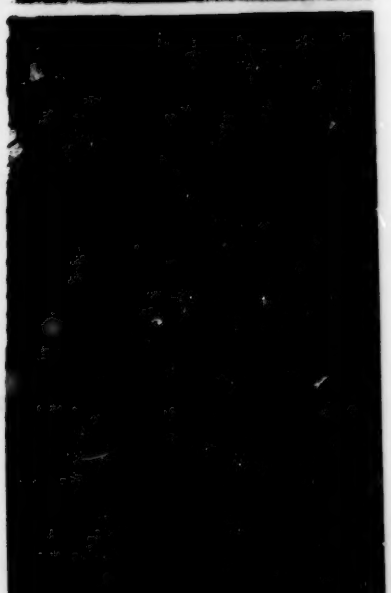


Supplying premium sandstone for new construction and restoration

Nova Scotia is a supplier of premium sandstone for the needs of today's architects and builders. Sandstone cladding panels are suitable on buildings where a warm and open atmosphere is desired. Sandstone dimension blocks can also provide an attractive contrast when used with various cladding materials.

Nova Scotia sandstone is easily worked into columns, carvings, intricate mouldings and other applications and is available in rough blocks, sawn slabs or worked in detail if required. For the restoration mason, Nova Scotia sandstone — available in many colours and textures — can often be a perfect match for the sandstone which he is replacing.

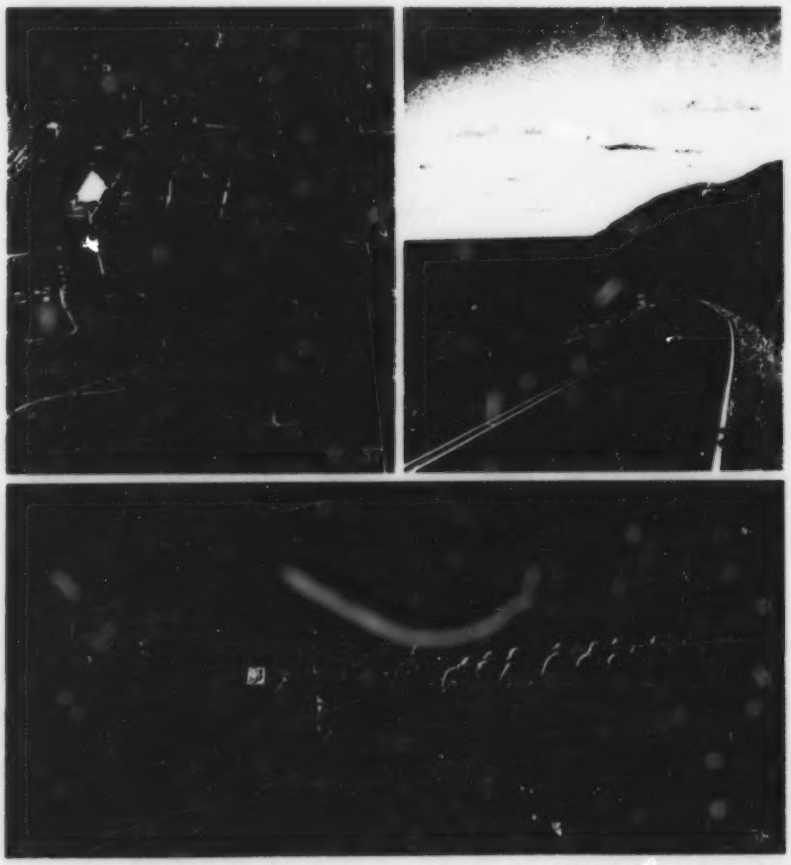
47 Wallace sandstone 8" cladding — Dominion Public Building, Halifax
48 Art Gallery of Nova Scotia — Dominion Building restoration, Halifax
49 Rock faced ashlar in North Grant sandstone — Guilmora Hall, Antigonish
50 Confederation Centre of the Arts — Charlottetown, P.E.I.
51 Province House restored, 1987 — Halifax
52 Olive and red sandstone — Mount Allison University, Sackville, N.B.
53 McKeen quarry sandstone — Provincial Legislature, P.E.I.
54 Chamfered fluted quoins — Province House, Halifax
55 North Grant sandstone
56 Wallace sandstone column and capital — Province House, Halifax

Living with stone

Nova Scotia has been a supplier of sandstone and granite building stone for over 200 years. The craft of working with stone has passed down through the generations and with the present architectural trend toward the greater use of building stone, a whole new generation of stone masons have again taken up the tools and are producing the highest quality work. Utilizing the latest technology in sawing and polishing equipment, local fabricators have the tools to go with the know-how required to succeed in a competitive marketplace.

For the quarrier, Nova Scotia offers a number of development opportunities in sandstone, granite and marble. For the designer, Nova Scotia offers the choice of a wide range of stone products to enhance the value and appearance of building projects.

Nova Scotia has a lifestyle which is the envy of many other regions of Canada. A blend of modern urban centers set in a unique, scenic coastline environment, Nova Scotia's quality of life can provide a true inspiration for residing designers, developers and quarriers or for those seeking development opportunities. The DeGarthe Monument, cut from solid granite at Peggys Cove, is a tribute to traditions of hard work and enterprising people who make Nova Scotia their home.



57 Citadel Hill overlooking downtown Halifax
58 DeGarthe sculpture in granite – Peggys Cove
59 Scene along the Cabot Trail – Cape Breton Island
60 Driving plug and feathers to split granite block
61 Apprentice mason at the banker
62 Sculpting in Marble Mountain marble
63 Lettering a monument blank

Building Stone Producers

Secondary Manufacturers

For Additional Information Contact

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